

REMARKS

This amendment is responsive to the Final Office Action of March 27, 2008. Claims 4, 8-10 and 15 have been amended herein to cure minor informalities. Also, claim 7 was presented as new in the previous response; applicants' representative apologizes for the underlining and strikethrough. Reconsideration and allowance of claims 2-21 are requested.

The Office Action

The Examiner has objected to claims 2-5 and 7-10. It is understood that once the objection is resolved, claims 2-5 and 7-10 will stand allowed.

Claims 6 and 11-13 stand allowed.

Claims 14-21 were rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements.

Claims 14-19 and 21 were rejected under 35 U.S.C. § 103(a) as unpatentable over Atalar *et al.* (U.S. 5,699,801) in view of Hastings *et al.* (U.S. Pub. No. 2002/0103430) and further in view of Moore *et al.* (U.S. Pub. No. 2002/0007120).

Claim 21 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Objection to the Drawings

The drawings were objected to because in Figure 2, elements 20, 21, 22 and 23 are empty boxes labeled with a reference numeral. A substitute Figure 2 with labeled boxes is enclosed.

Objection to the Abstract

The abstract was objected to because the abstract does not commence on a separate sheet in accordance with 37 C.F.R. 1.52(b)(4). Furthermore, the word "sheath" was misspelled. This objection should be withdrawn for at least the following reasons. The misspelling of "sheath" has been corrected. Thus, the objection should be withdrawn.

Objection to the Specification

The Specification was objected to because of various informalities. This objection should be withdrawn for at least the following reasons. The Specification has been amended as shown above, and the informalities have been cured.

The Present Application

The present application is directed to a system that inhibits resonance within a catheter and/or cable at a characteristic magnetic resonance frequency. To this end, the cable is constructed in a manner to achieve a low shortening factor.

The present application discloses conductors 4 of a positioning antenna 4,5 running along a catheter 1. When leads run along a catheter, the excitation RF field is typically received by the leads causing heating of the surrounding portion of the patient. The present application operates these leads at a positioning frequency. To inhibit heating, first the shortening factor is chosen such that the common mode or positioning frequency is shifted from the imaging resonance frequency. Second, the leads are minimized in diameter to a minimum which is still sufficient to carry D.C. power to components at the catheter tip and carry imaging data and other information from a receiving coil 12 and other electronics in the tip.

35 U.S.C. § 112

Claim 20 has been placed in independent form. This alleviates the first 35 U.S.C. § 112 rejection (conductor diameter and conductor spacing).

Claims 20 and 21 have been amended to specify the permittivity of the sheath. It is submitted that this alleviates the second 35 U.S.C. § 112 rejection (relative permittivity).

Claim 21 has been amended to claim the magnetic resonance frequency more forcefully.

Accordingly, it is submitted that claims 15, 17 and 19-21 now comply with 35 U.S.C. § 112, second paragraph.

The Present Amendment Should be Entered

The present amendment places claim 20 in independent form, including the subject matter of its parent claims. Placing a dependent claim in independent form does not require further search or consideration.

Claims 20 and 21 have been amended to address the 35 U.S.C. § 112 issues. The added permittivity limitation was searched and considered with claim 18. Accordingly,

the amendment should be entered as simplifying the issues on appeal by eliminating 35 U.S.C. § 112 issues.

The References of Record

Atalar *et al.* provides a method for magnetic resonance imaging and spectroscopic analysis of the interior of a specimen. Radio Frequency (R.F.) pulses are provided to a region of interest to excite magnetic resonance signals.

Atalar *et al.* only discloses that the distance between electrodes is between 0.1 mm and 30 mm.

Hastings *et al.* illustrates a method of magnetically manipulating a medical device within a human patient.

Moore *et al.* illustrates an elongated catheter body with a rotor situated at the distal end.

The Claims Distinguish Patentably Over the References of Record

Claims 15, 17, 19 and 20

Independent claim 20 recites *a position sensor coil array disposed adjacent the examination zone, the position sensor coil array transmits RF positioning signals at a positioning frequency, the positioning frequency being shifted from the imaging resonance frequency.* The cited references, alone or in combination, fail to disclose or suggest such a feature. Furthermore, the claimed subject matter is not rendered obvious by the combination of the cited references.

Atalar *et al.* introduces an invasive probe with an elongated receiver coil into the specimen, and then extracts information from the specimen by reading magnetic pulses. However, **Atalar *et al.*** fails to disclose or suggest any type of position sensor coil array. Thus, the cited reference is silent with respect to *the position sensor coil array transmits RF positioning signals at a positioning frequency*, as claimed.

Furthermore, **Hastings *et al.*** fails to disclose or suggest the claimed subject matter. **Hastings *et al.*** is silent with respect to a position sensor coil array that transmits RF positioning signals at a positioning frequency. Thus, **Hastings *et al.*** fails to disclose or

suggest *the position sensor coil array transmits RF positioning signals at a positioning frequency*, as claimed.

Moore *et al.* relates to an elongated catheter body with a rotor situated at the distal end. However, Moore *et al.* is also silent with regard to a position sensor coil array. Therefore, Moore *et al.* fails to disclose or suggest *the position sensor coil array transmits RF positioning signals at a positioning frequency*, as independent claim 14 recites.

In view of the foregoing, it is readily apparent that the cited references do not render claim 20 obvious. Therefore, it is respectfully requested that this rejection be withdrawn with respect to independent **claim 20** and dependent **claims 15, 17 and 19**.

Claim 21

Moreover, independent claim 21 recites *the electrical conductors being configured to have a common mode frequency that is greater than a magnetic resonance excitation frequency of the associated magnetic resonance imaging machine*. None of the references of record address this concept. Accordingly, it is submitted that **claim 21** distinguishes patentably over the references of record, and that this rejection be withdrawn.

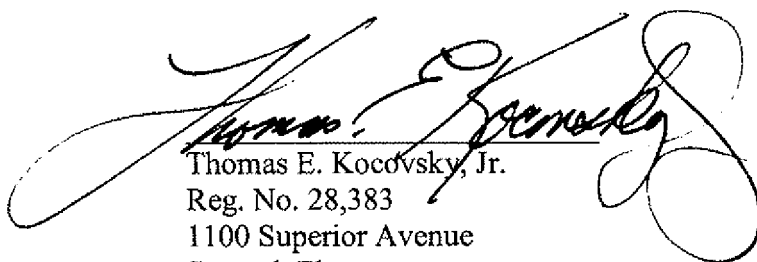
CONCLUSION

For the reasons set forth above, it is submitted that claims 2-13, 15, 17 and 19-21 (all claims) distinguish patentably over the references of record and meet all statutory requirements. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case(s), he is requested to telephone Thomas E. Kocovsky, Jr. at (216) 861-5582.

Respectfully submitted,

Fay Sharpe LLP

A large, stylized handwritten signature in black ink, which appears to read "Thomas E. Kocovsky, Jr.", is written over the printed name and address.

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